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Notice of Allowability

Application No.

09/578,095

Examiner

Kandasamy Thangavelu

Applicant(s)

ARAGONES ET AL.

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to May 4, 2004 and June 4, 2004.
2. ☒ The allowed claim(s) is/are 1-6,9-16,20-26,29-36,40-46,49-56,60-66 and 69-81.
3. ☐ The drawings filed on _____ are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).
 - * Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
6. ☒ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☒ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date 3.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____

KEVIN A. TESKA
SUPERVISORY
PATENT EXAMINER

DETAILED ACTION

Introduction

1. This communication is in response to the Applicants' communications dated May 4, 2004 and June 4, 2004. Claims 1-6, 9-16, 20-26, 29-36, 40-46, 49-56, 60-66, 69-76 and 80-81 of the application are pending.

Petition to Withdraw the Finality of the Office Action

2. Acknowledgement is made of the applicants' petition dated May 4, 2004 to withdraw the finality of the Office Action of April 4, 2004. The petition is moot in view of the applicants' request dated June 4, 2004 for reconsideration of the office action. The request is persuasive and has resulted in this allowance of the application.

Drawings

3. The drawings filed on May 25, 2000 are acceptable subject to correction of the informalities indicated on the "Notice of Draftperson's Patent Drawing Review," PTO-948 attached to paper No. 3. In order to avoid abandonment of this application, correction is required in reply to the Office action. The correction will not be held in abeyance.

Examiner's Amendment

4. Authorization for this examiner's amendment was given in a telephone interview with Mr. David Goldman on June 15, 2004.

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

5. The application has been amended as follows:

In the amended Claim 1, Para 4 change:

“a performance deterioration rate analyzer that analyzes performance deterioration rate of the product from the plurality of service information and performance information, wherein the performance deterioration rate analyzer comprises a statistical analysis script that relates a subset of compartments of the product according to time, wherein the statistical analysis script generates an estimated deterioration rate curve for the subset of compartments of the product, wherein the performance deterioration rate analyzer further comprises a transformer that transforms each estimated deterioration rate curve for a compartment to a performance life distribution; and”

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to

-- a performance deterioration rate analyzer that analyzes performance deterioration rate of the product from the plurality of service information and performance information, wherein the performance deterioration rate analyzer comprises a statistical analysis script that relates performance information of a subset of compartments of the product according to time, wherein the statistical analysis script generates an estimated deterioration rate curve for the subset of compartments of the product, wherein the performance deterioration rate analyzer further comprises a transformer that transforms each estimated deterioration rate curve for a compartment to a performance life distribution; and--.

In the amended Claim 22, Para 4 change:

“means for performing a deterioration rate analysis that determines performance deterioration rate of the product from the plurality of service information and performance information, wherein the performing means comprises a statistical analysis script that relates a subset of the plurality of compartments of the product according to time, wherein the statistical analysis script generates an estimated deterioration rate curve for a subset of the plurality of compartments of the product, wherein the performing means further comprises means for transforming each estimated deterioration rate curve for a compartment to a performance life distribution; and”

to

-- means for performing a deterioration rate analysis that determines performance deterioration rate of the product from the plurality of service information and performance information, wherein the performing means comprises a statistical analysis script that relates performance information of a subset of the plurality of compartments of the product according to time, wherein the statistical analysis script generates an estimated deterioration rate curve for a subset of the plurality of compartments of the product, wherein the performing means further comprises means for transforming each estimated deterioration rate curve for a compartment to a performance life distribution; and--.

In the amended Claim 42, Para 4 change:

“performing a deterioration rate analysis of the product from the plurality of service information and performance information, wherein the performing comprises using a statistical analysis script that relates a subset of the plurality of compartments of the product according to time, wherein the statistical analysis script generates an estimated deterioration rate curve for a subset of the plurality of compartments of the product, wherein the performing a deterioration rate analysis further comprises transforming each estimated deterioration rate curve for a compartment to a performance life distribution; and”

to

-- performing a deterioration rate analysis of the product from the plurality of service information and performance information, wherein the performing comprises using a statistical analysis script that relates performance information of a subset of the plurality of compartments of the product according to time, wherein the statistical analysis script generates an estimated deterioration rate curve for a subset of the plurality of compartments of the product, wherein the performing a deterioration rate analysis further comprises transforming each estimated deterioration rate curve for a compartment to a performance life distribution; and--.

In the amended Claim 62, Para 4 change:

“A computer-readable medium storing computer instructions for instructing a computer system to predict the timing of a future service event of a product formed from a plurality of compartments, the computer instructions comprising”

to

-- A computer-readable medium storing computer instructions which when executed on a computer system predict the timing of a future service event of a product formed from a plurality of compartments, the computer instructions comprising--.

In the amended Claim 62, Para 4 change:

“performing a deterioration rate analysis of the product from the plurality of service information and performance information, wherein the performing instructions comprise using a statistical analysis script that relates a subset of the plurality of compartments of the product according to time, wherein the statistical analysis script generates an estimated deterioration rate

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curve for a subset of the plurality of compartments of the product, wherein the performing instructions further comprise transforming instructions that transform each estimated deterioration rate curve to a performance life distribution; and”

to

-- performing a deterioration rate analysis of the product from the plurality of service information and performance information, wherein the performing instructions comprise using a statistical analysis script that relates performance information of a subset of the plurality of compartments of the product according to time, wherein the statistical analysis script generates an estimated deterioration rate curve for a subset of the plurality of compartments of the product, wherein the performing instructions further comprise transforming instructions that transform each estimated deterioration rate curve to a performance life distribution; and--.

Reasons for Allowance

6. Claims 1-6, 9-16, 20-26, 29-36, 40-46, 49-56, 60-66, 69-76 and 80-81 of the application are allowed over prior art of record.

7. The following is an Examiner's statement of reasons for the indication of allowable subject matter:

The closest prior art of record shows:

(1) statistical aspects of warranty repair predictions in automotive industry using a model of the multi component repairable system and Monte Carlo simulations; the time between system failures may be given by Weibull cumulative frequency distribution (**Kaminskiy et al.**, "A Monte Carlo approach to Warranty Repair predictions", SAE 1997);

(2) Engine maintenance management in aircraft industry; a detailed history of the key parts is compiled from the engine's repair history; the engine on-wing history identifies potential repair works; the information gathering is dynamic and is used by the maintenance group to develop the repair process; the process allows just-in-time material management and fewer spare engines (**Cribbes**, "Changes in engine maintenance management", Aerospace Engineering, 1997);

(3) probabilistic evaluation of the effect of maintenance on reliability; the component aging process is modeled and the mean and distribution of the remaining life to failure are predicted for any stage of aging; the scheme uses periodic and continuous condition monitoring, data analysis and failure effects analysis; probabilistic model is used for the failure and maintenance processes; Monte Carlo simulation is used to evaluate the probability distributions; a mathematical model linking the reliability of gradually deteriorating equipment to periodic inspections is constructed (**Endrenyi et al.**, "Probabilistic evaluation of the effects of maintenance on reliability", IEEE 1997); and

(4) system and method for diagnosing and predicting causes of engine performance degradation; the system evaluates changes in cylinder power balance over time; the cylinder differential values are compared to a predetermined limit value for an optimally performing engine; the engine firing time data is evaluated over time to form a prognosis as to the cause and

severity of the degradation in engine performance; a trend value is derived from all firing time; if the trend value exceeds a trend boundary, a warning signal is generated indicating a degradation in engine performance; the rate and magnitude of the change in trend value is used as an indication of the source and severity of the problem (**Wang**, U. S. Patent 6,230,095).

7.1 Applicant's first set of claims consists of Claims 1-6, 9-16 and 20-21.

Independent Claim 1 is directed to a system for predicting the timing of a future service event of a product formed from a plurality of compartments. The claim identifies the uniquely distinct features of:

"a performance deterioration rate analyzer that analyzes performance deterioration rate of the product from the plurality of service information and performance information, wherein the performance deterioration rate analyzer comprises a statistical analysis script that relates performance information of a subset of compartments of the product according to time, wherein the statistical analysis script generates an estimated deterioration rate curve for the subset of compartments of the product, wherein the performance deterioration rate analyzer further comprises a transformer that transforms each estimated deterioration rate curve for a compartment to a performance life distribution".

The closest prior art fails to teach or fairly suggest that the performance deterioration rate analyzer comprises a statistical analysis script that relates performance information of a subset of compartments of the product according to time, wherein the statistical analysis script generates an estimated deterioration rate curve for the subset of compartments of the product, wherein the

performance deterioration rate analyzer further comprises a transformer that transforms each estimated deterioration rate curve for a compartment to a performance life distribution.

Therefore, Claims 1-6, 9-16 and 20-21 are deemed novel and allowable.

7.2 Applicant's second set of claims consists of Claims 22-26, 29-36 and 40-41.

Independent Claim 22 is directed to a system for predicting the timing of a future service event of a product formed from a plurality of compartments. The claim identifies the uniquely distinct features of:

“means for performing a deterioration rate analysis that determines performance deterioration rate of the product from the plurality of service information and performance information, wherein the performing means comprises a statistical analysis script that relates performance information of a subset of the plurality of compartments of the product according to time, wherein the statistical analysis script generates an estimated deterioration rate curve for a subset of the plurality of compartments of the product, wherein the performing means further comprises means for transforming each estimated deterioration rate curve for a compartment to a performance life distribution”.

The closest prior art fails to teach or fairly suggest that the performing means comprises a statistical analysis script that relates performance information of a subset of the plurality of compartments of the product according to time, wherein the statistical analysis script generates an estimated deterioration rate curve for a subset of the plurality of compartments of the product, wherein the performing means further comprises means for transforming each estimated

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deterioration rate curve for a compartment to a performance life distribution. Therefore, Claims 22-26, 29-36 and 40-41 are deemed novel and allowable.

7.3 Applicant's third set of claims consists of Claims 42-46, 49-56 and 60-61.

Independent Claim 42 is directed to a method for predicting the, timing of a future service event of a product formed from a plurality of compartments. The claim identifies the uniquely distinct features of:

“performing a deterioration rate analysis of the product from the plurality of service information and performance information, wherein the performing comprises using a statistical analysis script that relates performance information of a subset of the plurality of compartments of the product according to time, wherein the statistical analysis script generates an estimated deterioration rate curve for a subset of the plurality of compartments of the product, wherein the performing a deterioration rate analysis further comprises transforming each estimated deterioration rate curve for a compartment to a performance life distribution”.

The closest prior art fails to teach or fairly suggest that the performing comprises using a statistical analysis script that relates performance information of a subset of the plurality of compartments of the product according to time, wherein the statistical analysis script generates an estimated deterioration rate curve for a subset of the plurality of compartments of the product, wherein the performing a deterioration rate analysis further comprises transforming each estimated deterioration rate curve for a compartment to a performance life distribution. Therefore, Claims 42-46, 49-56 and 60-61 are deemed novel and allowable.

7.4 Applicant's third set of claims consists of Claims 62-66, 69-76 and 80-81.

Independent Claim 62 is directed to a computer-readable medium storing computer instructions for instructing a computer system to predict the timing of a future service event of a product formed from a plurality of compartments. The claim identifies the uniquely distinct features of:

“performing a deterioration rate analysis of the product from the plurality of service information and performance information, wherein the performing instructions comprise using a statistical analysis script that relates performance information of a subset of the plurality of compartments of the product according to time, wherein the statistical analysis script generates an estimated deterioration rate curve for a subset of the plurality of compartments of the product, wherein the performing instructions further comprise transforming instructions that transform each estimated deterioration rate curve to a performance life distribution”.

The closest prior art fails to teach or fairly suggest that the performing instructions comprise using a statistical analysis script that relates performance information of a subset of the plurality of compartments of the product according to time, wherein the statistical analysis script generates an estimated deterioration rate curve for a subset of the plurality of compartments of the product, wherein the performing instructions further comprise transforming instructions that transform each estimated deterioration rate curve to a performance life distribution. Therefore, Claims 62-66, 69-76 and 80-81 are deemed novel and allowable.

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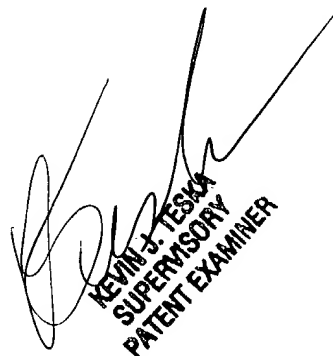
8. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dr. Kandasamy Thangavelu whose telephone number is 703-305-0043. The examiner can normally be reached on Monday through Friday from 8:00 AM to 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kevin Teska, can be reached on (703) 305-9704. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-9600.

K. Thangavelu
Art Unit 2123
June 15, 2004



KEVIN J. TESKA
SUPERVISORY
PATENT EXAMINER